Commonwealth of Massachusetts

Division of Energy Resources

State Heating Oil & Propane Program
Final Report
Winter 2007/2008

May 2008

Deval L. Patrick
Governor

Timothy P. Murray
Lt. Governor

Ian A. Bowles
Secretary, EOEEA

Philip Giudice
Commissioner

INTRODUCTION

The 2007/08 Winter Heating Season marks the15th year of the Massachusetts Division of Energy Resources' (DOER) participation in the U.S. Department of Energy's annual *State Heating Oil and Propane Program* (SHOPP). SHOPP requires states to collect and monitor retail heating oil and propane prices from October through March. SHOPP augments existing DOER data collection efforts and serves several important purposes. The information provides policy-makers with timely, accurate and consistent data to monitor current heating oil and propane markets and develop, when necessary, appropriate state responses to potential fuel problems. The information also helps the federal and state governments respond to consumer, congressional and media inquiries regarding heating oil and propane.

The SHOPP report summarizes the results from the Massachusetts retail heating oil and propane price surveys, including supply and demand events that affected those markets. Also included are a seasonal overview and a summary of how the SHOPP program is used to augment DOER functions.

Findings

Record Prices to Begin Heating Season

The 2007/2008 winter heating season began with record high prices for both heating oil and propane. Heating oil opened the season at $2.72/gallon, surpassing the previous high of $2.60/gallon in October of 2005, following the Gulf Hurricanes. In 2006, heating oil opened the heating season at $2.36/gallon, 15% less than this year.

Propane also opened the heating season at a record high of $2.47/gallon, surpassing its previous high of $2.33/gallon in December of 2005. In 2006, propane was $2.25/gallon, 10% less than this year.

The main reason for the high prices was the record high crude oil prices. Crude oil prices began rising in the spring and summer of 2007 and continued that trend throughout the heating season. Other factors that effect heating fuel prices are weather and inventories. Combine a normal winter, with lower inventories and record crude prices and the impact on fuel prices is extreme. Unfortunately for Massachusetts consumers, this winter had such a combination,

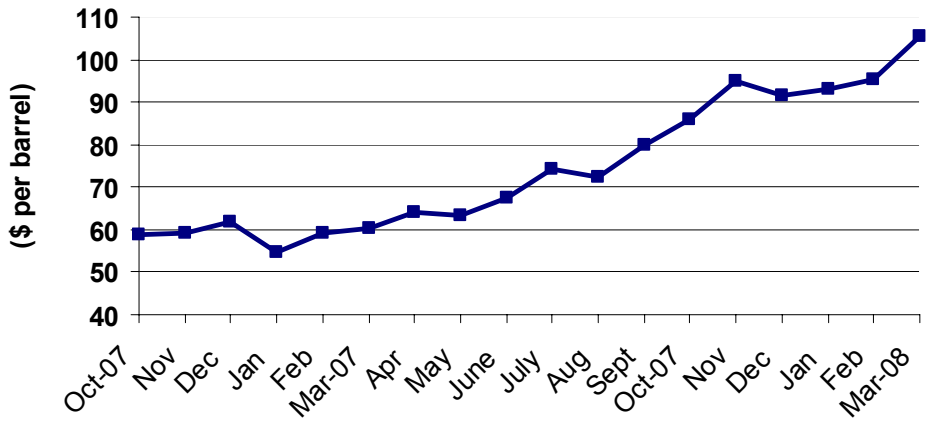
leading to record high prices and heating bills for heating oil and propane. The following chronicles what happened this winter to lead to these high prices.

Crude Prices Surge to $100/Barrell

Crude Oil Prices

The extraordinary news this heating season was dramatic and record breaking increases in the spot price of West Texas Intermediate (WTI) crude oil, the U.S. benchmark for crude oil. Crude oil prices were also the biggest factor this year affecting retail heating fuel prices. As shown in the graph below, monthly average crude oil prices, over the course of this winter, rose from $80 in the beginning of October to over $105 per barrel. This was an increase of $25 per barrel in just six months. Even more striking is the fact that crude oil prices the previous October were about $59 per barrel.

WTI Spot Crude Oil Prices



October

In October 2007, WTI crude oil averaged about $86 per barrel, a 46% increase over the $59 per barrel price the previous October. In fact, crude oil prices started out at $80 per barrel at the beginning of October and were $94 per barrel at the end of that month.

DOER monitored the crude oil prices as some analysts predicted that oil prices could reach $100 per barrel and that would translate into an unprecedented high level of heating fuel prices. Some analysts believed that world oil supplies were in tight supply because of no increase in production coupled with continued increase in consumption, especially in the Asian markets as well as in oil producing countries like Mexico, Saudi Arabia and others. On the other hand, some analysts said that the fundamentals did not support the high price of crude oil. These analysts thought speculators on the futures market were causing prices to rise. In any event, this heating season started with talk of

a slowing in U.S. economic growth, a credit crunch, a falling dollar, concerns about crude oil production and U.S. inventories, and possible cut backs in Venezuelan oil production and product sales to the U.S., and threats by Turkey to launch military operations against Kurdish insurgents in Iraq. (The insurgents were threatening to blow up Turkish oil pipelines.) Even the IEA in Paris stated that crude oil stocks in the OECD countries around the world continued to fall in September at a time when they typically increase in preparation for the winter heating season and warned that there might be tight conditions in the fourth quarter. By mid-month, there was pressure on OPEC, particularly Saudi Arabia, to increase oil production, but it remained uncertain if they would do so.

November

This months crude prices averaged $94.77 per barrel, a $9 per barrel jump since October's crude price average. This month the price climbed from $93.50 up to $99.16, but at the very end of the month, the price fell to $88.60. Prices did not hit the "$100 per barrel" benchmark, but with U.S. crude oil stocks continuing to drop, analysts were starting to say that $100 per barrel oil was a certainty. At an average of almost $95 per barrel this month, crude oil prices were now up 60% over a year ago.

During this month there more and more news stories on crude oil and product prices as crude oil was reaching $100 per barrel. There were crude oil supply concerns due to shut-ins of North Sea crude oil platforms and some in Mexico due to weather conditions.

In early November, the U.S. average price for retail diesel hit $3.24 per gallon, breaking the previous record established in the aftermath of Hurricane Rita in October 2005. According to the November 13th OPIS alerts, heating oil dealers through their associations were telling the press that dealers were "…feeling the pinch from high finance costs and limited credit lines amid sky high oil prices." Suppliers had to fork out more cash or max out their credit lines to maintain their oil inventories. Basically, with the same credit lines, it will allow suppliers and retailers to hold less fuel. And finance costs would be higher due to the higher oil prices. In addition, suppliers were faced with late payments from customers due to the high price of heating fuels. The dealers' association in NY said that speculation in the energy commodity markets was causing price volatility. In mid-November, OPEC ministers met, but did not hike output, putting a decision off until December. They insisted that there was adequate supplies of crude oil and blamed the run up in prices to a weak U.S. dollar (price of oils are pegged to the U.S. dollar) and increased market speculation, and said there needs to be more worldwide product refining capacity.

December

December crude oil prices averaged of $91.69, less than in November. Early in the month, prices were $89, but reached $96.63 during the last week.

Oil prices swung up and down about $5 per barrel throughout the month based on various market incidences throughout the month such as the drop in U.S. crude oil stocks below the 5 year average, the assassination of Pakistani opposition leader Bhutto, no increase in OPEC quotas, and tight world supplies of product.

January

On January 2, 2008, the NYMEX hit the much anticipated $100 per barrel oil mark. However, the average price for crude oil in January was $92.97, up $1.28 per barrel on average since December, but up $7 per barrel since the beginning of the season and about $38.50 per barrel higher than last January.

During this month there was more discussion about what would happen to oil demand as the U.S. faces recession. Demand in countries like China and the Middle East continued to climb. Even President Bush's announcement about a stimulus package including rebates to consumers did not dampen oil prices. In addition, although crude oil stocks began to climb, U.S. refinery activity started to slow as refiners started maintenance in preparation of the summer driving season.

February

During February, the average price of WTI crude oil was $95.39 per barrel. On February 1st, the price was $89, but during the month prices rose and went over the $100 per barrel mark several times.

At their February 1st meeting, OPEC again resisted pressure to increase production quotas. In the U.S. there were continued fears about a recession and decline in the dollar's value. There were also several geopolitical events going on leading to volatility in the oil market, such as militants in Nigeria attacking oil fields which suspended oil shipments, Turkey's ground attack on Kurdish rebels in northern Iraq, and Venezuela's threat to stop oil sales to Exxon in retaliation for having a court freeze Venezuelan assets in the U.S. and Europe.

March

By March, average spot crude prices were $105.45 and reach $110 per barrel by mid-month. Prices fluctuated widely between $100 and $110 throughout the month, setting record highs throughout the month. The Federal Reserve Bank continued to cut interest rates in the hopes of stimulating the economy but the result seemed to have further weakened the dollar and drove up oil prices. Many analysts continued to say that the price increases were driven by speculators in the commodities market. Again at the March 5th meeting of OPEC, production quotas were unchanged. Secretary of Energy Bodman said that the high crude prices were due to low world crude inventories and not speculators.

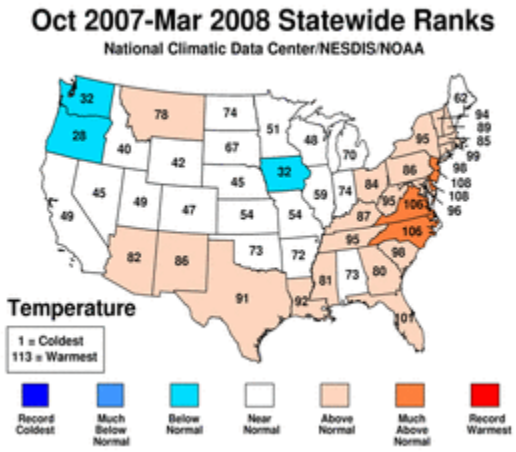
With crude prices pushing winter fuel prices to record highs, the only way to moderate the impact, was if winter weather and inventories were both higher than average. Unfortunately, neither of these things occurred.

Winter Weather Close to Normal

Traditionally, weather is one of key components impacting heating fuel demand. Warmer weather usually translates to lower demand and prices while colder weather translates to higher demand and prices. The previous winter was 5.6% warmer than normal. Early season forecasts from the National Oceanic and Atmospheric Association (NOAA), predicted Massachusetts and the rest of New England had an equal chance for normal, above normal, and below normal temperatures.

Overall, temperatures for the 2007/08 winter were about 1% above normal in Massachusetts. Figure 1 highlights the temperatures across the United States.

Figure 1



Heating Degree Days (Boston, MA)

This heating season started out with one of the warmest October's in several years. This month was 40.7% warmer than normal for October, as measured in heating degree days. November and December were colder than normal compared to the 30-year normal for each of those months. November was 8.28% colder than normal and December was 7.08% colder. Furthermore, by December 17th more snow fell in Boston (19.6 inches) than all of last year (17.1 inches). December's snowfall of 26.9 inches was one inch short of the all-time record of 27.9 inches in 1970. For January, heating degree days were 11.96% warmer than normal for that month. February and March were about normal for those respective months.

The heating season, as measured in heating degree days from July 1 – March, was actually 4.6% warmer than normal. However, eliminating the warm month of October, then the season from November through March was only about 1% warmer than normal.

Unfortunately for consumers, this heating season had more normal weather patterns compared to the last two heating seasons. This weather pattern meant consumers used more heating fuels, all else being equal. Additionally, on top of the cold weather, crude oil prices also skyrocketed; meaning consumers probably used more oil and paid more for the product.

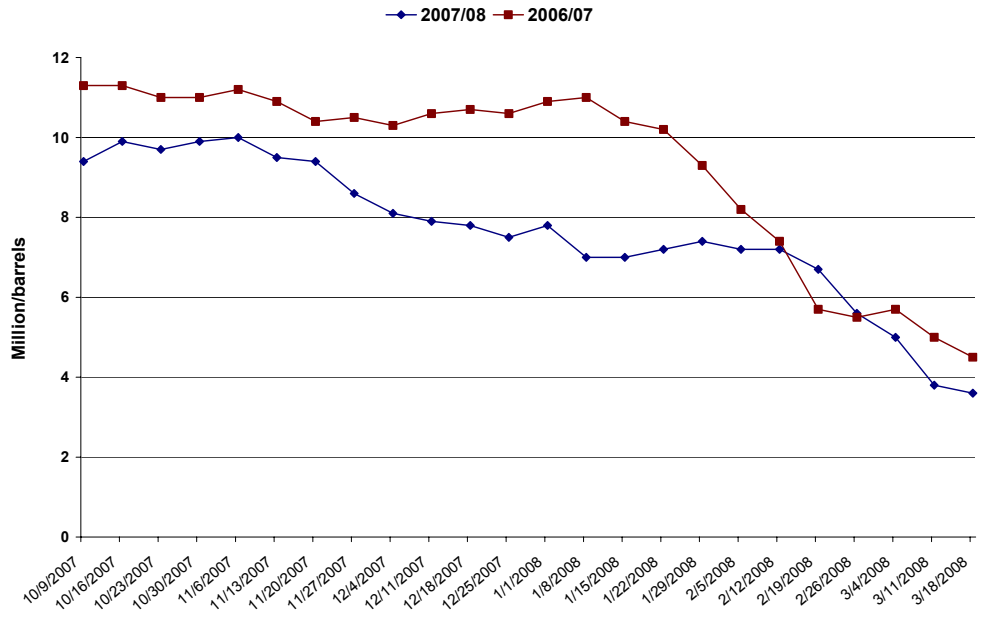
Inventories Start Season Lower than Previous Winter

Inventories are another key component in winter fuel prices. Low inventories can lead to shortages which lead to price spikes. Conversely, high inventories can help dampen prices by providing excess product. This heating season, heating oil inventories were lower than the previous year, while propane inventories started low but ended high.

Heating Oil

Heating oil stocks started the heating season 17% below last year's level and ended the heating season at 20% below last year. By mid-January stocks dipped to 36% below last year but rebounded slightly in February to 18% above last year. Figure 2 compares heating oil stocks over the past two years.

Figure 2: Heating Oil Stocks



Overall, heating oil stocks were lower this winter than last. The main factor was the increasing wholesale price of heating oil, a direct result of the increased price of crude oil, and the uncertainty if the high wholesale price would

be sustained throughout the winter or drop. Heating oil is predominantly a winter seasonal product used mostly in the Northeast. Wholesaler sellers did not want to risk buying high priced fuel and storing excess quantities of it should the prices drop in the later winter months resulting in their losing money.

A minor portion of the lower inventory levels as compared to other years is attributed to changes in EIA reporting of heating oil and some diesel fuel due to changes in EPA regulations regarding the allowed sulfur content of diesel fuel. On December 1, 2007, low sulfur diesel fuel meeting a sulfur content of 500 ppm or less is the only fuel permitted for off-road diesel vehicles and equipment and marine and locomotive engines. In the past, heating oil and diesel for those applications had similar sulfur contents leading to some interchangeable use.

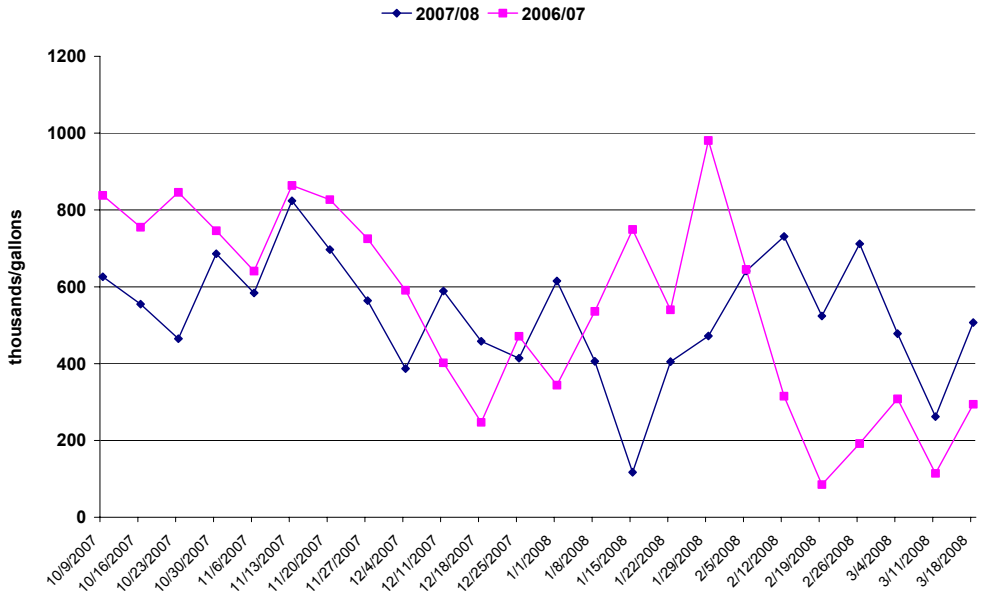
There is a concern going forward into future heating seasons that continued record prices, could lead to tight supplies and possible shortages, if severe winter weather prevents supplemental supplies from coming into New England.

Propane

As the season began, propane stocks in New England were 25% below last year's level but at the end of the season inventories were 72% above last year.

Propane supplies in New England are just-in-time inventories. Propane inventory levels fluctuate throughout the winter. Only a few New England terminals store propane brought in by ships; the rest of the supply comes in by trucks or rail. Any disruption to the delivery or infrastructure systems can adversely affect supplies and prices. Figure 3 compares this year's stocks to last year's.

Figure 3: Propane Stocks



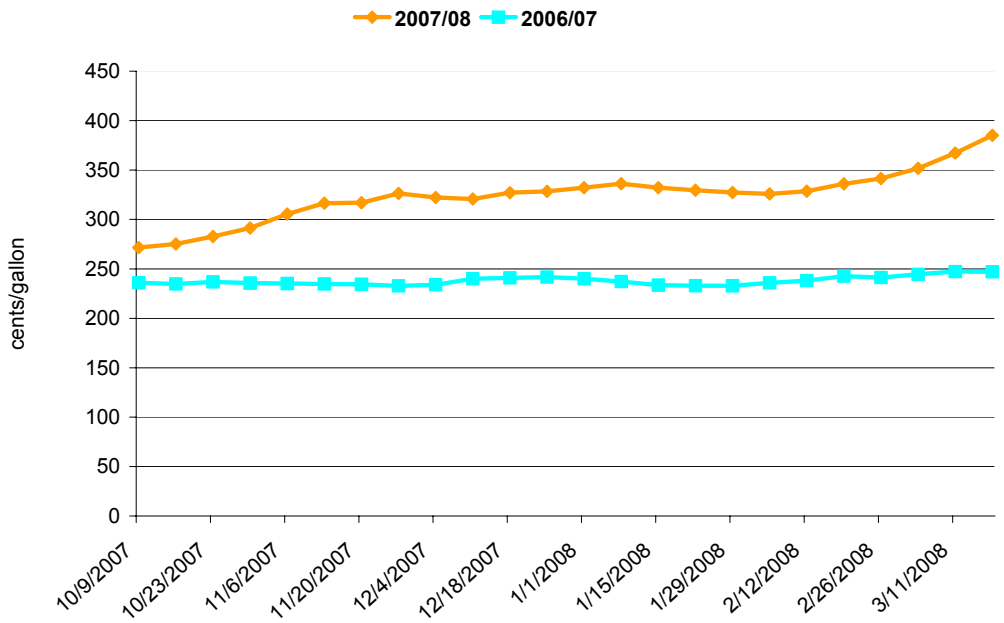
Last season, in February 2007, stocks were adversely affected by supply issues caused by winter storms, rail strikes and pipeline outages to the TEPPCO line that services New York. While this season stocks fluctuated, there were no serious supply disruptions, leading to stocks being slightly higher at the end of this heating season.

Consumers Hit Hard by Record High Prices

Heating Oil

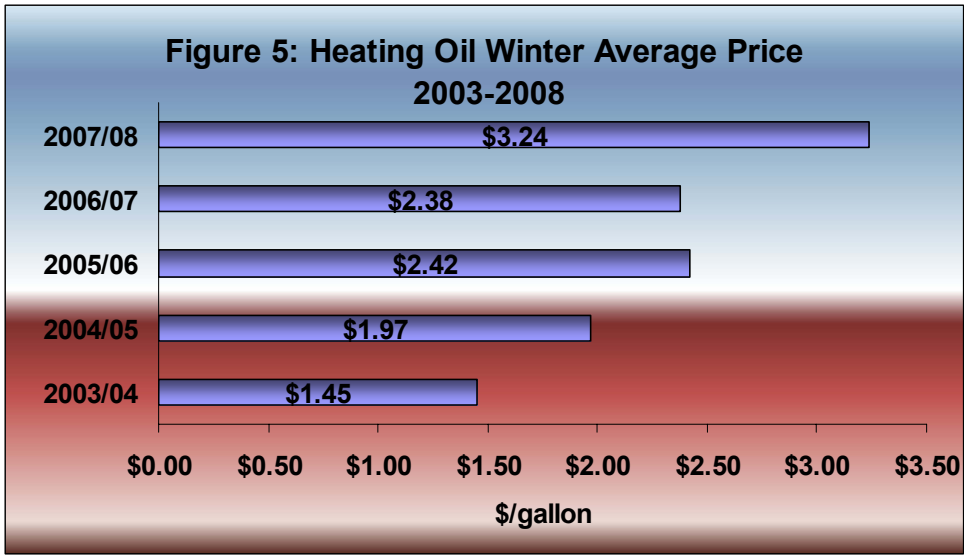
Due to record crude prices, heating oil prices began this heating season at record levels ($2.72/gallon vs. $2.36/gallon, last year). Unfortunately for consumers, these prices did not abate but continued to break records throughout the year. The continued increase in crude prices, lower stocks and colder than normal weather in November and December helped keep prices on the rise. Even the more normal winter weather from January-March did nothing to stop prices from reaching over $3.00/gallon to end the season at $3.85/gallon, 56% above last year's season ending price of $2.47/gallon. Figure 4 illustrates the price comparison for the past two winters.

Figure 4: Heating Oil Price Comparison



Another illustration of how high prices went this winter is a comparison of the past five years' seasonal average prices. Since 2003, the seasonal average heating oil price rose 123%, from $1.45/gallon to this year/s $3.24/gallon as shown in Figure 5.

Source: DOER Weekly SHOPP Surveys, 2003-2008



To understand the full impact of price increases on consumers, one needs only to look at the bill impacts over the last five years. In 2003, the average MA household paid $1,148 to heat their home with heating oil in the winter compared with $2,475 this winter. Table 1 provides a look at how increased prices impacted overall consumer bills from 2003-2008.

Table 1: Massachusetts Average Residential Heating Oil Winter Bill					
Month	**2003/2004**	**2004/05**	**2005/06**	**2006/07**	**2007/08***
Oct	$1.30	$1.95	$2.55	$2.36	$2.80
Nov	$1.33	$1.98	$2.40	$2.34	$3.16
Dec	$1.41	$1.91	$2.37	$2.41	$3.25
Jan	$1.53	$1.92	$2.41	$2.35	$3.31
Feb	$1.57	$1.96	$2.39	$2.42	$3.33
Mar	$1.55	$2.08	$2.40	$2.47	$3.68
Average	**$1.45**	**$1.97**	**$2.42**	**$2.39**	**$3.24**
Average Usage (gallons)	**792**	**791**	**743**	**749**	**764**
Average Winter Bill	**$1,148.00**	**$1,554.79**	**$1,798.54**	**$1,791.36**	**$2,475.36**

**Consumption data is based on US EIA "This Week in Petroleum, Winter Outlook", 2007/08 Data is estimated*

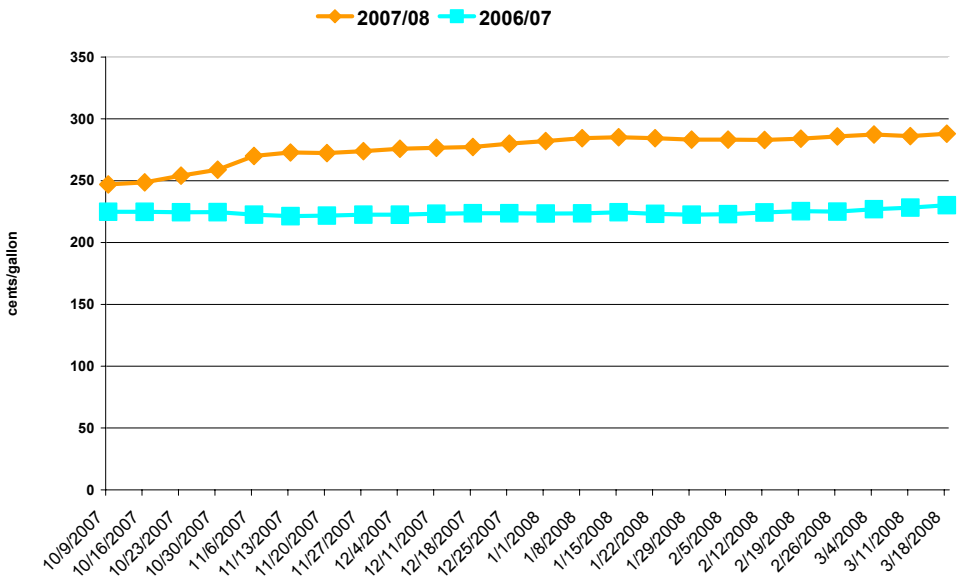
The average MA household heating oil bill rose 116% in five years. With crude prices continuing to rise, there is no relief forthcoming for consumers and there are real concerns for next heating season. Approximately 36% percent of homes in Massachusetts heat with heating oil, meaning that over a third of Massachusetts households could face even higher costs next heating season.

Propane

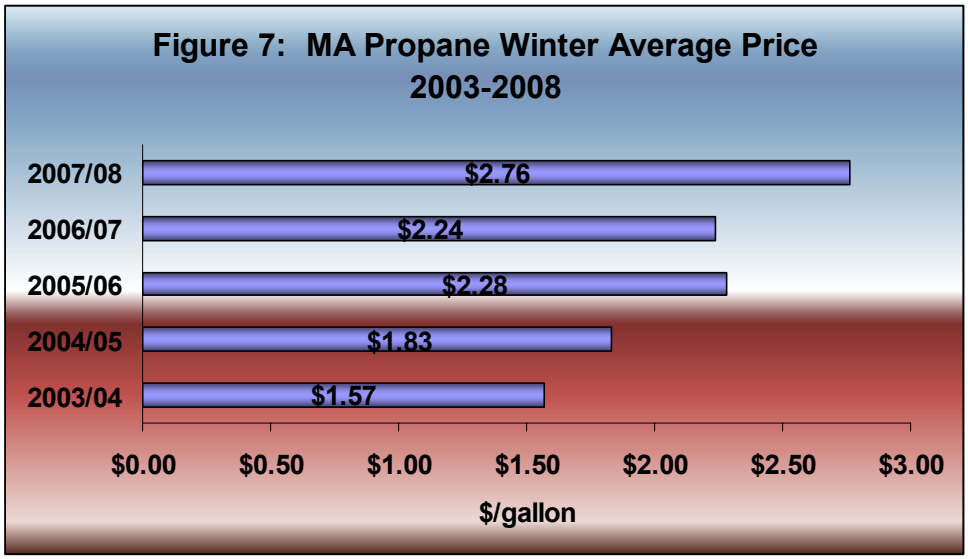
Massachusetts propane prices were also adversely impacted by high crude oil prices at the beginning of the season. Propane prices started this season at a record high $2.47/gallon, 10% higher than last year ($2.25). The previous record high for propane was set in December 2005 at $2.33/gallon.

While the increases in propane prices were not as severe as with heating oil, prices rose steadily throughout the winter ending the season at $2.88/gallon compared to $2.30/gallon last year, an increase of 25%. Propane's season average of $2.76/gallon was 23% higher than last winter's average price of $2.24/gallon. Figure 6 compares the last two winter season's prices.

Figure 6: MA Winter Propane Prices Comparison



Similar to heating oil, propane prices also rose significantly over the past five years. In 2003/04 the winter seasonal price for propane was $1.57/gallon, this year it was $2.76/gallon, an increase of 76%. Figure 7 illustrates the prices over the past 5 years.



The increase in propane prices substantially increased the average household winter heating bill for Massachusetts propane customers. Table 2 shows the impact on the propane heating bill for the last five years.

Table 2: Massachusetts Residential Propane Prices					
Month	**2003/2004**	**2004/05**	**2005/06**	**2006/07**	**2007/08**
Oct	$1.46	$1.76	$2.26	$2.24	$2.52
Nov	$1.48	$1.85	$2.29	$2.22	$2.72
Dec	$1.52	$1.86	$2.29	$2.24	$2.77
Jan	$1.63	$1.84	$2.28	$2.23	$2.84
Feb	$1.69	$1.83	$2.28	$2.25	$2.84
Mar	$1.67	$1.86	$2.26	$2.29	$2.87
Average	***$1.57***	***$1.83***	***$2.28***	***$2.25***	***$2.76***
Average Usage (gallons)	***870***	***869***	***808***	***816***	***836***
Average Winter Bill	***$1,369.24***	***$1,590.89***	***$1,840.29***	***$1,831.92***	***$2,307.36***

Consumption data from US EIA, *"This Week in Petroleum, Winter Outlook", 2007/08 Data is estimated*

The average bill for MA households heating with propane increased from $1,369 to $2,307 over the past five years or 68%. While not as great an increase as heating oil, it is still a substantial hit for those consumers heating with propane. About 3% of Massachusetts households heat with propane.

Price Summary

Overall this winter's record increases in heating oil and propane prices adversely affected Massachusetts consumers. Heating oil customers saw a 36% increase in the average price, while propane customers seasonal price increased 23%. Coupled with increases over the previous five years, the average Massachusetts household using heating oil and propane is paying 123% more for heating oil and 76% more for propane than in 2003. Even with varying consumption during the heating season, heating oil bills increased 116% and propane bills by 68% over this same time period. Should this trend continue over the next few years, there are real concerns about the ability of the about 40% of Massachusetts households that use these fuels to afford to heat their homes.

SHOPP Data Used to Support DOER Activities

One of DOER's most important functions is to provide accurate and timely information on energy prices and supplies to the government, media and consumers of the Commonwealth. SHOPP is a valuable asset to the data collection and price monitoring activities involved in this function. It enables DOER to provide information to policy makers who must act quickly in the event of an emergency.

DOER collects and posts pricing information from the SHOPP surveys for heating oil and propane on our website, www.mass.gov/doer. This information is updated weekly during the winter and monthly during the off-season. Numerous groups and consumers use these surveys to measure their prices against the

state average price collected under SHOPP. During this year's record high price increase, DOER saw increased web traffic and calls from the media and consumers. Additionally, other state agencies use our SHOPP information in handling their related energy programs.

DOER also uses the SHOPP information during the New England States' and Energy Industry Conference Calls. From October through March, DOER staff participates in weekly calls regarding the winter fuels situation. The calls are hosted by the New England Governors' Conference (NEGC) and participants include energy offices in New England and New York; energy industry representatives including the Northeast Gas Association, ISO-New England; the U.S. Coast Guard, Massachusetts Petroleum Council and the U.S. DOE. Participants exchange data about heating oil, natural gas and electricity winter supplies and prices.

As in every winter, DOER uses information from its SHOPP surveys and the NEGC calls to advise the Massachusetts Emergency Management Agency (MEMA) on whether it should issue driver hour waivers for truck drivers of heating fuels. This winter did not see any supply disruptions warranting state intervention.

Other meetings attended by DOER that utilize SHOPP data include the Massachusetts Department of Housing and Community Development's (DHCD) Energy Advisory Meetings. As part of its duties under its management of the Commonwealth's Weatherization Assistance Program (WAP), DHCD holds quarterly meetings on its weatherization and Low-Income Home Energy Assistance Program (LIHEAP), also known as fuel assistance. As a member of this group, DOER provides information on prices and supplies. DHCD briefs group members on the status of these federal programs including funds, allocations, and number of recipients.

The SHOPP program is a critical component in DOER's mission to provide accurate energy price information to the Commonwealth and its citizens. Massachusetts residents traditionally endure long and cold winters and knowing what prices are as well as where they are headed is extremely important. For these reasons, DOER looks forward to its continued participation in SHOPP.